

Appl. No. 09/940,371
Amdt. AF dated July 8, 2004
Reply to Final Office Action of May 21, 2004

Amendments to the Claims

This listing of claims will replace all prior versions, and listing, of claims in the application:

Listing of Claims:

1. (Previously Presented) An implantable cardioverter-defibrillator for subcutaneous positioning between the third rib and the twelfth rib within a patient, the implantable cardioverter-defibrillator comprising:

a housing, wherein at least a portion of the housing is curved, wherein the housing further comprises a first segment and a second segment, each segment having an insulating plate at an end thereof, and a conductive plate coupled to the insulating plate, wherein the conductive plate of the first segment is coupled to the conductive plate of the second segment to form a unitary implantable device;

an electrical circuit; and

an electrically conductive surface integrally positioned on a portion of the housing, wherein the electrically conductive surface is coupled to the electrical circuit.

2. (Original) The implantable cardioverter-defibrillator of claim 1, wherein the housing comprises an electrically insulated material.

3. (Withdrawn) The implantable cardioverter-defibrillator of claim 1, wherein the housing is pliable.

4. (Cancelled)

5. (Original) The implantable cardioverter-defibrillator of claim 1, wherein the housing comprises a ceramic material.

6. (Original) The implantable cardioverter-defibrillator of claim 5, wherein the ceramic material is selected from the group consisting essentially of zirconia, alumina, silicon nitride,

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silicon carbide, titanium carbide, tungsten carbide, titanium nitride, silicon-aluminum oxy-nitride (sialon), graphite, titanium di-boride, boron carbide, zirconia toughened alumina, and molybdenum disilicide.

7. (Original) The implantable cardioverter-defibrillator of claim 6, wherein the zirconia is selected from the group consisting essentially of stabilized zirconia, partially stabilized zirconia, tetragonal zirconia, yttria-stabilized zirconia, magnesia-stabilized zirconia, ceria-stabilized zirconia, and calcia-stabilized zirconia.

8. (Original) The implantable cardioverter-defibrillator of claim 1, wherein the housing comprises a mixture of ceramic materials and titanium.

9. (Cancelled)

10. (Previously Presented) The implantable cardioverter-defibrillator of claim 1, wherein at least a portion of the first segment is curved.

11. (Previously Presented) The implantable cardioverter-defibrillator of claim 1, wherein at least a portion of the second segment is curved.

12. (Original) The implantable cardioverter-defibrillator of claim 1, wherein the curved portion of the housing comprises a circular arc.

13. (Original) The implantable cardioverter-defibrillator of claim 1, wherein the curved portion of the housing comprises an elliptical arc.

14. (Original) The implantable cardioverter-defibrillator of claim 1, wherein the curved portion of the housing comprises a nonsymmetrical arc.

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15. (Original) The implantable cardioverter-defibrillator of claim 11, wherein the curved portion of the second segment comprises a circular arc.

16. (Original) The implantable cardioverter-defibrillator of claim 11, wherein the curved portion of the second segment comprises an elliptical arc.

17. (Original) The implantable cardioverter-defibrillator of claim 11, wherein the curved portion of the second segment comprises a nonsymmetrical arc.

18. (Previously Presented) The implantable cardioverter-defibrillator of claim 1, wherein the second segment of the housing is substantially straight.

19. (Previously Presented) The implantable cardioverter-defibrillator of claim 1, wherein the first segment of the housing is contiguous with the second segment of the housing.

20. (Withdrawn) The implantable cardioverter-defibrillator of claim 9, wherein the first segment of the housing is disjointed with the second segment of the housing.

21. (Withdrawn) The implantable cardioverter-defibrillator of claim 9, wherein a hinge couples the first segment of the housing to the second segment of the housing.

22. (Original) The implantable cardioverter-defibrillator of claim 1, wherein the electrical circuit provides cardioversion-defibrillation energy for the patient's heart.

23. (Original) The implantable cardioverter-defibrillator of claim 22, wherein the electrical circuit further provides biphasic waveform cardiac pacing for the patient's heart.

24. (Original) The implantable cardioverter-defibrillator of claim 1, wherein the electrical circuit provides biphasic waveform cardiac pacing for the patient's heart.

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25. (Original) The implantable cardioverter-defibrillator of claim 1, wherein the electrically conductive surface emits an energy for shocking the patient's heart.

26. (Original) The implantable cardioverter-defibrillator of claim 26, wherein the electrically conductive surface further receives sensory information.

27. (Original) The implantable cardioverter-defibrillator of claim 1, wherein the electrically conductive surface can receive sensory information.

28. (Currently Amended) A cardioverter-defibrillator comprising:
an electrode;

a housing having a curved portion, wherein the electrode is integrally disposed in the curved portion of the housing such that the electrode is maintained in a predetermined relationship subcutaneously over a patient's ribs, and wherein the housing further comprises a first segment and a second segment, each segment having an insulating plate at an end thereof, and a conductive plate coupled to the insulating plate, wherein the conductive plate of the first segment is coupled to the conductive plate of the second segment to form a unitary implantable device; and

[[a]] cardioversion-defibrillation circuitry located within the housing and coupled to the electrode.

29. (Previously Presented) The cardioverter-defibrillator of claim 28, wherein the electrode emits energy for shocking a patient's heart.

30. (Previously Presented) The cardioverter-defibrillator of claim 29, wherein the electrode further receives sensory information.

31. (Previously Presented) The cardioverter-defibrillator of claim 28, wherein the electrode receives sensory information.

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32. (Withdrawn) The cardioverter-defibrillator of claim 28, wherein the housing is pliable.

33. (Cancelled)

34. (Original) The cardioverter-defibrillator of claim 28, wherein the housing comprises a ceramic material.

35. (Original) The cardioverter-defibrillator of claim 34, wherein the ceramic material is selected from the group consisting essentially of zirconia, alumina, silicon nitride, silicon carbide, titanium carbide, tungsten carbide, titanium nitride, silicon-aluminum oxy-nitride (sialon), graphite, titanium di-boride, boron carbide, zirconia toughened alumina, and molybdenum disilicide.

36. (Original) The cardioverter-defibrillator of claim 35, wherein the zirconia is selected from the group consisting essentially of stabilized zirconia, partially stabilized zirconia, tetragonal zirconia, yttria-stabilized zirconia, magnesia-stabilized zirconia, ceria-stabilized zirconia, and calcia-stabilized zirconia.

37. (Original) The cardioverter-defibrillator of claim 36, wherein the housing comprises a mixture of ceramic materials and titanium.

38. (Cancelled)

39. (Previously Presented) The cardioverter-defibrillator of claim 28, wherein the curved portion of the housing comprises a circular arc.

40. (Previously Presented) The cardioverter-defibrillator of claim 39, wherein the circular arc is approximately 1 radians to approximately 180 radians in length.

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41. (Previously Presented) The cardioverter-defibrillator of claim 28, wherein the curved portion of the housing comprises an elliptical arc.

42. (Previously Presented) The cardioverter-defibrillator of claim 28, wherein the curved portion of the housing comprises a nonsymmetrical arc.

43. (Original) The cardioverter-defibrillator of claim 28, wherein the predetermined relationship is with respect to the patient's heart.

44. (Withdrawn) The cardioverter-defibrillator of claim 28, wherein the at least one curved portion of the housing maintains the electrode subcutaneously over an area defined between the patient's third rib and the patient's twelfth rib.

45. (Original) The cardioverter-defibrillator of claim 28, wherein the cardioversion-defibrillation circuitry further provides waveform cardiac pacing for a patient's heart.

46. (Previously Presented) A subcutaneous cardioverter-defibrillator comprising:
a housing having a top surface and a bottom surface, wherein at least a portion of the bottom surface of the housing is non planar, wherein the housing further comprises a first segment and a second segment, each segment having an insulating plate at an end thereof, and a conductive plate coupled to the insulating plate, wherein the conductive plate of the first segment is coupled to the conductive plate of the second segment to form a unitary implantable device;
an electrical circuit located within the housing; and
an electrode integrally positioned on a portion of the housing, wherein the electrode couples to the electrical circuit, and further wherein the electrode can provide an effective electric field for myocardial cardioversion and defibrillation.

47. (Original) The subcutaneous cardioverter-defibrillator of claim 46, wherein the housing comprises an electrically insulated material.

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48. (Withdrawn) The subcutaneous cardioverter-defibrillator of claim 46, wherein the housing is pliable.

49. (Cancelled)

50. (Original) The subcutaneous cardioverter-defibrillator of claim 46, wherein the housing comprises a ceramic material.

51. (Original) The subcutaneous cardioverter defibrillator of claim 50, wherein the ceramic material is selected from the group consisting essentially of zirconia, alumina, silicon nitride, silicon carbide, titanium carbide, tungsten carbide, titanium nitride, silicon-aluminum oxy-nitride (sialon), graphite, titanium di-boride, boron carbide, zirconia toughened alumina, and molybdenum disilicide.

52. (Original) The cardioverter-defibrillator of claim 51, wherein the zirconia is selected from the group consisting essentially of stabilized zirconia, partially stabilized zirconia, tetragonal zirconia, yttria-stabilized zirconia, magnesia-stabilized zirconia, ceria-stabilized zirconia, and calcia-stabilized zirconia.

53. (Original) The subcutaneous cardioverter-defibrillator of claim 46, wherein the housing comprises a mixture of ceramic and titanium.

54. (Canceled)

55. (Original) The subcutaneous cardioverter-defibrillator of claim 46, wherein the portion of the bottom surface of the housing being non planar comprises a circular arc.

56. (Original) The subcutaneous cardioverter-defibrillator of claim 46, wherein the portion of the bottom surface of the housing being non planar comprises an elliptical arc.

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57. (Original) The subcutaneous cardioverter-defibrillator of claim 46, wherein the portion of the bottom surface of the housing being non planar comprises a nonsymmetrical arc.

58. (Original) The subcutaneous cardioverter-defibrillator of claim 46, wherein the bottom surface of the housing is substantially smooth.

59. (Withdrawn) The subcutaneous cardioverter-defibrillator of claim 46, wherein the bottom surface of the housing is larger than the top surface of the housing.

60. (Withdrawn) The subcutaneous cardioverter-defibrillator of claim 46, wherein a portion of the top surface of the housing is substantially planar.

61. (Original) The subcutaneous cardioverter-defibrillator of claim 46, wherein a portion of the top surface of the housing is substantially non planar.

62. (Original) The subcutaneous cardioverter-defibrillator of claim 61, wherein the portion of the top surface of the housing being non planar comprises a circular arc.

63. (Original) The subcutaneous cardioverter-defibrillator of claim 61, wherein the portion of the top surface of the housing being non planar comprises an elliptical arc.

64. (Original) The subcutaneous cardioverter-defibrillator of claim 61, wherein the portion of the top surface of the housing being non planar comprises a nonsymmetrical arc.

65. (Original) The subcutaneous cardioverter-defibrillator of claim 46, wherein the top surface of the housing is substantially smooth.

66. (Previously Presented) The subcutaneous cardioverter-defibrillator of claim 46, wherein the bottom surface further comprises a proximal end and a distal end, wherein the electrode is integrally positioned at the proximal end of the bottom surface.

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67. (Original) The subcutaneous cardioverter-defibrillator of claim 66, wherein a second electrode is integrally positioned at the distal end of the bottom surface.

68. (Original) The subcutaneous cardioverter-defibrillator of claim 46, wherein the electrical circuit can provide cardioversion-defibrillation energy for the patient's heart.

69. (Original) The subcutaneous cardioverter-defibrillator of claim 68, wherein the electrical circuit further provides biphasic waveform cardiac pacing for the patient's heart.

70. (Original) The subcutaneous cardioverter-defibrillator of claim 46, wherein the electrical circuit provides biphasic waveform cardiac pacing for the patient's heart.

71. (Previously Presented) The subcutaneous cardioverter-defibrillator of claim 46, wherein the electrode emits an energy for treating the patient's heart.

72. (Previously Presented) The subcutaneous cardioverter-defibrillator of claim 71, wherein the electrode further receives sensory information.

73. (Previously Presented) The subcutaneous cardioverter-defibrillator of claim 46, wherein the electrode receives sensory information.

74 – 84. (Cancelled)

85. (Previously Presented) An implantable cardioverter-defibrillator for subcutaneous positioning between the third rib and the twelfth rib within a patient, the implantable cardioverter-defibrillator comprising:

a housing comprising a mixture of conductive and nonconductive materials wherein at least a portion of the housing is curved;

an electrical circuit; and

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an electrode integrally positioned on a portion of the housing, wherein the electrode is coupled to the electrical circuit.

86. (Original) The implantable cardioverter-defibrillator of claim 85, wherein the housing comprises a mixture of ceramic materials and titanium.

87. (Original) The implantable cardioverter defibrillator of claim 85, wherein the housing further comprises a first segment and a second segment, each segment having an insulating plate at an end thereof, and a conductive plate coupled to the insulating plate, wherein the conductive plate of the first segment can be coupled to the conductive plate of the second segment to form a unitary implantable device.

88. (Original) The implantable cardioverter-defibrillator of claim 87, wherein at least a portion of the first segment is curved.

89. (Original) The implantable cardioverter-defibrillator of claim 87, wherein at least a portion of the second segment is curved.

90. (Original) The implantable cardioverter-defibrillator of claim 85, wherein the curved portion of the housing comprises a circular arc.

91. (Original) The implantable cardioverter-defibrillator of claim 85, wherein the curved portion of the housing comprises an elliptical arc.

92. (Original) The implantable cardioverter-defibrillator of claim 85, wherein the curved portion of the housing comprises a nonsymmetrical arc.

93. (Original) The implantable cardioverter-defibrillator of claim 87, wherein the curved portion of the second segment comprises a circular arc.

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94. (Original) The implantable cardioverter-defibrillator of claim 87, wherein the curved portion of the second segment comprises an elliptical arc.

95. (Original) The implantable cardioverter-defibrillator of claim 87, wherein the curved portion of the second segment comprises a nonsymmetrical arc.

96. (Original) The implantable cardioverter-defibrillator of claim 87, wherein the second segment of the housing is substantially straight.

97. (Original) The implantable cardioverter-defibrillator of claim 87, wherein the first segment of the housing is contiguous with the second segment of the housing.

98. (Withdrawn) The implantable cardioverter-defibrillator of claim 87, wherein the first segment of the housing is disjointed with the second segment of the housing.

99. (Withdrawn) The implantable cardioverter-defibrillator of claim 87, wherein a hinge couples the first segment of the housing to the second segment of the housing.

100. (Original) The implantable cardioverter-defibrillator of claim 85, wherein the electrical circuit provides cardioversion-defibrillation energy for the patient's heart.

101. (Original) The implantable cardioverter-defibrillator of claim 100, wherein the electrical circuit further provides biphasic waveform cardiac pacing for the patient's heart.

102. (Original) The implantable cardioverter-defibrillator of claim 85, wherein the electrical circuit provides biphasic waveform cardiac pacing for the patient's heart.

103. (Previously Presented) The implantable cardioverter-defibrillator of claim 85, wherein the electrode can emit an energy for treating the patient's heart.

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104. (Previously Presented) The implantable cardioverter-defibrillator of claim 103, wherein the electrode can further receive sensory information.

105. (Previously Presented) The implantable cardioverter-defibrillator of claim 85, wherein the electrode can receive sensory information.

106 – 117 (Cancelled)

118. (Currently Amended) A cardioverter-defibrillator comprising:
an electrode;

a housing comprising a mixture of conductive and nonconductive materials wherein the electrode is integrally disposed in the housing such that the electrode is maintained in a predetermined relationship subcutaneously over a patient's ribs; and

[[a]] cardioversion-defibrillation circuitry located within the housing and coupled to the electrode.

119. (Previously Presented) The cardioverter-defibrillator of claim 118, wherein the electrode emits an energy for shocking a patient's heart.

120. (Previously Presented) The cardioverter-defibrillator of claim 119, wherein the electrode further receives sensory information.

121. (Previously Presented) The cardioverter-defibrillator of claim 118, wherein the electrode receives sensory information.

122. (Withdrawn) The cardioverter-defibrillator of claim 118, wherein the housing is pliable.

123. (Cancelled)

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124. (Original) The cardioverter-defibrillator of claim 118, wherein the housing comprises a mixture of ceramic materials and titanium.

125. (Previously Presented) The implantable cardioverter defibrillator of claim 124, wherein the housing further comprises a first segment and a second segment, each segment having an insulating plate at an end thereof, and a conductive plate coupled to the insulating plate, wherein the conductive plate of the first segment is coupled to the conductive plate of the second segment to form a unitary implantable device.

126. (Original) The cardioverter-defibrillator of claim 118, wherein the predetermined relationship is with respect to the patient's heart.

127. (Original) The cardioverter-defibrillator of claim 118, wherein the electrode is maintained subcutaneously over an area defined between the patient's third rib and the patient's twelfth rib.

128. (Original) The cardioverter-defibrillator of claim 118, wherein the cardioversion-defibrillation circuitry further provides cardiac pacing for a patient's heart.

129 – 148. (Cancelled)

149. (Previously Presented) A subcutaneous cardioverter-defibrillator comprising:
a housing comprising a mixture of conductive and nonconductive materials, the housing having a top surface and a bottom surface;
an electrical circuit located within the housing; and
an electrode integrally positioned on a portion of the housing, wherein the electrode couples to the electrical circuit, and further wherein the electrode can provide an effective electric field to treat the myocardium.

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150. (Withdrawn) The subcutaneous cardioverter-defibrillator of claim 150, wherein the housing is pliable.

151. (Cancelled)

152. (Previously Presented) The subcutaneous cardioverter-defibrillator of claim 149, wherein the housing comprises a mixture of ceramic and titanium.

153. (Previously Presented) The subcutaneous cardioverter-defibrillator of claim 149, wherein the housing further comprises a first segment and a second segment, each segment having an insulating plate at an end thereof, and a conductive plate coupled to the insulating plate, wherein the conductive plate of the first segment is coupled to the conductive plate of the second segment to form a unitary implantable device.

154. (Previously Presented) The subcutaneous cardioverter-defibrillator of claim 149, wherein the bottom surface of the housing is substantially smooth.

155. (Previously Presented) The subcutaneous cardioverter-defibrillator of claim 149, wherein the top surface of the housing is substantially smooth.

156. (Previously Presented) The subcutaneous cardioverter-defibrillator of claim 149, wherein the bottom surface further comprises a proximal end and a distal end, wherein the electrode is integrally positioned at the proximal end of the bottom surface.

157. (Previously Presented) The subcutaneous cardioverter-defibrillator of claim 156, wherein a second electrode is integrally positioned at the distal end of the bottom surface.

158. (Previously Presented) The subcutaneous cardioverter-defibrillator of claim 149, wherein the electrical circuit can provide cardioversion-defibrillation energy for the patient's heart.

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159. (Previously Presented) The subcutaneous cardioverter-defibrillator of claim 158, wherein the electrical circuit further provides biphasic waveform cardiac pacing for the patient's heart.

160. (Previously Presented) The subcutaneous cardioverter-defibrillator of claim 149, wherein the electrical circuit provides cardiac pacing for the patient's heart.

161. (Previously Presented) The subcutaneous cardioverter-defibrillator of claim 149, wherein the electrode emits an energy for treating the patient's heart.

162. (Previously Presented) The subcutaneous cardioverter-defibrillator of claim 161, wherein the electrode further receives sensory information.

163. (Previously Presented) The subcutaneous cardioverter-defibrillator of claim 149, wherein the electrode further receives sensory information.

164. (Currently Amended) An implantable cardioverter-defibrillator comprising:
a housing including a first segment and a second segment, each segment having an insulating plate at an end thereof, and a conductive plate coupled to the insulating plate, wherein the conductive plate of the first segment is coupled to the conductive plate of the second segment to form a unitary implantable device;
an electrode disposed on the housing; and
[[a]] cardioversion-defibrillation circuitry located within the housing and coupled to the electrode.

165. (Previously Presented) An implantable cardioverter-defibrillator comprising:
a housing comprising a mixture of conductive and non conductive materials;
an electrode disposed on the housing; and
a cardioversion-defibrillation circuitry located within the housing and coupled to the electrode.